



Urban Challenge

Technical Paper Guidelines

January 8, 2007

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Urban Challenge

Technical Paper Guidelines

1. Introduction

The technical paper is part of the Urban Challenge qualification process and constitutes 25% of the overall site visit score used to select semifinalists to participate in the National Qualification Event (NQE). In addition, the technical paper is used to disseminate information and facilitate discussion within the broader technical community. The technical paper enables teams to educate and inform the community, and to make their contribution to the program's legacy.

This document provides submission instructions, content guidelines, and the evaluation factors used in assessing a technical paper. All technical papers and the information they convey will be held confidential until the completion of the Urban Challenge, at which time the papers will be posted on the DARPA Grand Challenge website.

2. Applicability

This document applies to the selection process for the competitive Urban Challenge autonomous vehicle event.

Information in this document applies to contracted efforts (such as those undertaken by teams on Track A) only as instructed by the DARPA contracting officer. Nothing in this document should be understood or construed to modify the terms of any contract or agreement. Success or failure in meeting milestones in a contracted effort does not determine success or failure in becoming an Urban Challenge semifinalist.

3. Guidelines

Submission. Technical papers from Track A teams must be received by DARPA by 5:00 pm ET on April 13, 2007. The deadline for the Track B team technical papers is 5:00 pm ET on June 1, 2007. All technical papers must be uploaded to <https://www.tfims.darpa.mil/urbanchallenge>. E-mail submissions will not be accepted.

Format. Two copies of the paper shall be uploaded, one in portable document format (.pdf) for publication on the web, and one MSWord format (.doc or compatible). Both files are required.

The document shall be formatted using the layouts and conventions common to published technical papers in professional journals. Outlines, checklists, newspaper reports, or magazine articles will not be scored favorably.

One-inch margins are to be used (left, right, top, and bottom) on standard 8.5" x 11" letter page size. Manuscript text should be 12-point font with single space. Times New Roman or other easy-to-read font may be used for the body text, and Arial or other sans serif font for titling. Pages, equations, figures and tables should be numbered sequentially. Figures and tables must

have captions and should appear in the body of the text, not at the end of the document. The references should be gathered together after the end of the text under the heading “References.” Authors should use a consistent reference style similar to those used in technical journals. The length of the paper shall be no less than 10 and no more than 25 pages, including the cover page and references.

The title page should include the phrase “DARPA Urban Challenge”, the submission date, and the team name. Author names may include title and organizational affiliation, as required. Contact information including email address should be included for the corresponding author(s). The following text must be included on the title page in 10 point type:

“DISCLAIMER: The information contained in this paper does not represent the official policies, either expressed or implied, of the Defense Advanced Research Projects Agency (DARPA) or the Department of Defense. DARPA does not guarantee the accuracy or reliability of the information in this paper.”

Content. The content of the technical paper must be original work from the team. The paper executive summary should contain 200 words or less summarizing the key findings and novel approaches described in the paper. An introduction section may be used to describe the team and any other important background information.

The following topics must be covered:

- **Introduction and Overview**

The paper should discuss the overall problem to be solved and outline the team’s approach to a solution. Of key interest are the issues that drive design choices. The system architecture should be discussed.

- **Analysis and Design**

The paper should discuss the design choices made and the specific quantitative analysis that lead to these choices. Simulation results, mockups, performance tests, or other preliminary results should be presented.

- **Results and Performance**

The paper should describe the final realization and describe system performance measurements, test results, and other data that describe the measured performance.

Teams are encouraged to utilize photographs, charts, tables and diagrams within the text to support their presentation. Footnotes should be used to cite the sources of information throughout the document.

Teams should not include any information in their submission they do not want released to the public after the completion of DARPA Urban Challenge.

Questions regarding the technical paper should be addressed to grandchallenge@darpa.mil.

4. Evaluation Factors

The following equally weighted factors will be used in evaluating technical papers:

- Technical paper conforms to the guidelines in this document. Discussion of results is forthcoming and complete.
- Technical paper demonstrates a strong grasp of the problems associated with the Urban Challenge and presents a clear, complete approach to overcoming them.
- Technical paper demonstrates a deep quantitative understanding of the key design points and presents a reasoned, optimized design based on preliminary results.
- Technical paper describes testing methodology and results and gives a clear and complete explanation of vehicle capabilities.
- Approach described in the Technical Paper presents a credible approach to meeting the criteria laid out in the *Technical Evaluation Criteria* document.

5. Scoring

Each technical paper is evaluated by multiple reviewers who provide a quantitative score for each evaluation factor using the following scale:

- 4:** All required elements were presented clearly and convincingly. No weaknesses or shortfalls.
- 3:** Minor weaknesses. Technical Paper describes all of the required sections, but theory or justification is not entirely clear or complete.
- 2:** Major weaknesses or multiple serious shortfalls. Technical Paper does not fully explain or justify assertions.
- 1:** Sections of the Technical Paper are missing entirely. Technical assertions are not supported.

The reviewer's score for each paper is computed as the total score for each of the five criteria (maximum value 20). The composite score for each paper is the average of the reviewer scores.

6. Results Notification

DARPA will notify teams of their selection or non-selection as a semifinalist to attend the DARPA Urban Challenge National Qualification Event via email on or before August 10, 2007. Teams will not receive separate notification of their technical paper scores.

7. Data Rights

DARPA shall have Government purpose rights in the technical paper until November 4, 2007, at which time DARPA shall have unlimited rights.